

Towards Three-Dimensional Imaging of Yeast Spores Using Coherent X-ray Diffraction Microscopy

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The three-dimensional imaging of whole cells at around 10 nm resolution is of great biological interest. Using coherent x-ray diffraction microscopy, we demonstrate high-resolution imaging of an unlabelled yeast spore at different angles of tilt. The experiments were carried out on an undulator beamline at SPring-8, Japan. The collected diffraction data were analyzed using an explicit account for detector pixel size. Reconstructions of projections of the yeast spore, at differing angles, have been performed based on a guided hybrid input-output algorithm (GHIO). These reconstructions are shown, along with an account of the reconstruction method. This work represents a practical step toward routine three-dimensional imaging of unlabelled biological cells using X-ray diffraction microscopy.

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